

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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METRO FUEL LLC,

No. 07-VC-8244 (PAC)

Plaintiff,

vs.

CITY OF NEW YORK.

Defendant.
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DECLARATION OF JERRY WACHTEL

JERRY WACHTEL declares under penalty of perjury, pursuant to 28 U.S.C. § 1746, that the following is true and correct:

1. I am the President of the Veridian Group, which was established in 1982 to provide consulting services to Government, non-profit and corporate clients in areas of human factors and ergonomics, including: human performance; visibility and conspicuity; hazards and warnings; simulation; training and assessment; expectancy and situation awareness, distraction and attention; roadway design and traffic control devices (TCDs); and positive guidance concepts. My background includes more than 30 years of experience in research, project management, and consulting at all levels of Government and in private industry.

2. I have served as an expert witness in the areas of traffic safety, human factors, ergonomics, and engineering psychology in dozens of cases. I have never been denied qualification as an expert witness in any of those areas. I have served as an expert witness in cases in Alaska, Arkansas, California, The District of Columbia, Montana, New Jersey, Oregon, Pennsylvania, Virginia, and Washington.

3. A true and correct copy of my CV is attached hereto as Exhibit A.

4. I performed a field study of certain advertising signs in New York City at the request of Metro Fuel LLC (“Fuel”). The purpose of the study was to assess the design, placement, and operational characteristics of representative Fuel signs as well as advertising signs on street furniture placed on public property within the City of New York (the “City”) with specific regard to traffic safety and the potential for driver inattention and distraction.

5. It was explicitly recognized that the City has the authority as well as the responsibility to regulate commercial signage within its jurisdiction in furtherance of its mandate to protect public safety. My field study sought to determine whether the City was objectively and neutrally engaged in this practice vis a vis commercial signage.

6. As discussed in greater detail below, I conclude that the Fuel panel signs that I observed, almost without exception, cause me less concern about the potential for driver distraction than the advertising signs that I observed on the City's street furniture structures.

Background Regarding Driver Distraction Issues

7. Driver distraction is a subject of much current interest in the highway safety field. Until 20 years ago the subject was nearly unknown to researchers, regulatory officials, and enforcement authorities. Police traffic collision report forms provided no opportunity for an investigating officer to identify distraction as a factor in a crash; the closest categories were “inattentive driving” and “fell asleep at the wheel.” The popularity of the cellular telephone and the increase in accidents that are now known to be typical of inattention and distraction led to

research which continues unabated to this day (2,3).¹ As vehicle manufacturers and after-market suppliers continue to introduce new “infotainment” devices into vehicles, the problem of distraction has become much clearer and of greater concern (4,5). Today, it is hardly possible to find a scholarly text on human factors and traffic safety that does not devote at least a full chapter to the subject (6,7). However, with few exceptions over the years, the focus on driver distraction has been concentrated on sources inside the vehicle. Much less attention has been given to the risks of distraction from sources external to the vehicle (8,9). But with the proliferation of attention-commanding advertising signs, the increased visual complexity of the roadside environment with which drivers must cope, and ever increasing traffic density, regulators must ask whether restrictions are necessary to reduce the potential for driver distraction resulting from sources outside the vehicle. As a result, research has been conducted, world-wide, both in the laboratory and in the field, and recent studies have begun to show that such external factors, primarily outdoor advertising signs, can attract a driver’s gaze and attention, often for extended periods of time (10,11). When such behavior occurs when the driving demands are high, as they can be at certain locations in New York City, the concern about the potential for driver distraction is heightened.

8. Although we think of driving as predominantly a visual activity, everything that is observed must be processed by the brain before a driver can take any action based upon the visual scene. Thus, driving is really a cognitive task – one in which the driver must be attentive to the constantly changing environment through which he is moving. This environment includes the road or street, the vehicle being driven, visibility and weather conditions, other vehicular,

1. Numerical references in parentheses are keyed to the appendix of endnotes that is attached hereto as Exhibit B.

pedestrian and bicycle traffic, the rules of the road, and all of the surroundings in which the driving task must be performed.

9. Considerable research has clearly demonstrated that driver distraction or inattention is a significant cause of crashes (12,13). Distraction can result from characteristics of the driver himself (e.g. fatigue, illness, the influence of alcohol or drugs, daydreaming), from sources inside the vehicle (e.g. other passengers, cell phone conversations, adjusting the entertainment or navigation system), or from the stimuli in the environment that attract the driver's attention away from the forward roadway (e.g. scenic vistas, outdoor advertising signs, road construction, accidents, etc.). While many of these activities can be, and have been, regulated by agencies responsible for road safety (e.g. cell phone use, driving under the influence, use of navigation displays while in motion), others are not within regulatory authority. Outdoor advertising visible to drivers has long been regulated on Federal and State roadways, but under narrowly defined circumstances (14).

10. Advertising in all forms is intended to attract attention so that the sponsor's message can be communicated to the observer/viewer. Indeed, the root of the word advertise comes from the Latin *advertere*, "to turn toward."

11. Human vision is neurologically prewired to be attracted to certain stimuli. Specifically, objects that are brighter than others in the visual field, and those that move, flash, or appear to do so, are likely to capture a person's visual attention more compellingly than objects that don't possess these properties. Of course, once a person's gaze falls upon such an attention-getting object, the eye may not linger on it – at some point the content or salience of the message becomes more important in holding the viewer's attention if the object is to be fixated for any length of time. If the message holds no salience for the viewer, or if the message is irrelevant, the

eye may move to other objects in the visual scene.

12. Another characteristic of advertising signs that include actual or apparent motion that can hold a viewer's attention for extended periods of time relates to the sequencing of messages and the change interval between successive messages. The Zeigarnik Effect (18) suggests that people are uncomfortable with tasks or activities that are incomplete, and that they strive for closure. Thus, once an activity (such as looking at the message on an advertising sign) has begun, there is an innate need to view the complete message. Advertisers may exploit this human trait by sequencing a message – i.e. by designing a single message to be presented across multiple changes of a scrolling or LCD advertising sign. By “unfolding” parts of the message in this sequential fashion, the viewer may attend to the display until the entire message has been seen. Similarly, with signs such as scrollers, the time required to transition from one message to the next may command a viewer's attention while he anticipates the next display.

13. In driving, one must attend to many different objects in rapid succession. Other vehicles nearby, traffic signs, signals, and markings, the instruments in one's vehicle, the side and rear view mirrors, pedestrians, bicyclists and other road users, unexpected hazards, and other stimuli must all receive attention from the driver. This attention must be shared between these objects constantly (since the human is known as a single channel information processor with a finite cognitive capacity) and, to do so, attention must be quickly shifted from one object to another when the driving, traffic, or weather conditions require it. Traffic safety authorities have long known the key characteristics of visual attention as discussed above, and have used this understanding to further traffic safety by ensuring that certain, more important, objects in the visual scene are designed and placed to increase the likelihood that they will be noticed and attended to. Examples include: flashing lights on emergency vehicles, red traffic signals, boldly

striped crosswalks, alternating red lights demarcating obstacles, and distinctively colored warning signs where higher alert is necessary, such as orange for construction zones and “bright yellow green” for school crossings (1).

14. Recent studies have shown that, when the eye is distracted from the forward roadway view (which is the heart of the driving task) for longer than a brief interval (values from 0.75 to 1.6 seconds have been cited), the possibility of an accident may be increased (15,16,17). This forward roadway view is included in what is often called the “cone of vision.” Typically, the cone of vision is defined as the number of degrees on either side of the forward view in which human visual acuity is best, and which therefore should be reserved for official traffic control devices. In driving, the cone of vision is commonly described as +/- 10-12 degrees offset from the centerline of vision in the horizontal plane.

15. But the highway safety professional cannot wait for accidents to occur before intervening to reduce future accident likelihood. This is because accidents are relatively rare events (in terms of total vehicle miles driven daily), they are rarely reported to the police, and they are often a result of several interacting factors. It is for these and other reasons that traffic safety specialists look for other measures of risk – measures such as driver eye movements, situation awareness, reaction time, near misses, etc., as surrogates for actual crashes.

Relevance of Sign Characteristics to Driver Inattention/Distraction

16. From the perspective of traffic safety, research suggests that certain characteristics of advertising signs are more likely to contribute to driver distraction than others. These include:

- A sign with a fixed message is preferred to one that changes.
- A sign displaying video is least preferred.
- For changeable message signs, special visual effects are less preferable.
- Movement or apparent movement captures attention.
- Bright signs, particularly at night, capture attention earlier and may hold it longer, especially if the driver is initially too far away to read the message.
- A message which appears to flash (i.e. by actually flashing on and off or by periodic changes of brightness) can capture attention earlier and hold it longer.
- A static (unchanging) message may be ignored by drivers who pass the sign repeatedly but if the message is “always new” (as a result of the capability to change frequently) this acclimation effect may not be relevant.
- Sequenced messages (multiple changes of image to communicate a single thought, idea, or product) may hold attention longer due to the Zeigarnik Effect (18).
- Signs which are mounted above the driver’s horizontal line of sight are likely to be observed less frequently during demanding tasks, and more often when task demands are comparatively light; whereas signs closer to grade level are more likely to be observed as a driver performs his normal scanning for other vehicles, hazards, and traffic control devices. As such, an attention-getting sign closer to grade is more likely than a comparable elevated sign to capture a driver’s attention during critical driving tasks (19).

Analysis of Results

17. In the subsections below, I have identified the key characteristics of the signs of each type that I observed during the Field Study. Where appropriate, I have included a discussion of how these sign characteristics relate to issues of traffic safety.

A. Fuel Signs

18. I observed five types of Fuel signs:

- Those mounted close to grade flush to the walls inside garage entrances;
- Those mounted close to grade flush to building exterior walls and parallel to the direction of vehicle travel;
- Those mounted above grade and flush to walls facing the direction of vehicle travel;
- Those mounted above grade on posts or stands, typically two sign faces at approximately 45 degrees to one another; and
- Those mounted to exterior building walls above grade attached to an armature which extended them over the sidewalk. These were also typically 2-faced signs angled from one another.

19. Many Fuel signs were located mid-block, and were wall mounted at grade within the entrances to commercial parking garages. These signs have less potential to cause inappropriate driver distraction than the City sanctioned signs because they are set back from the curb line considerably farther than the City sanctioned signs and thus are less likely to enter or remain in the driver's cone of vision.

20. Several Fuel signs were located at or near intersections. Most of these were post mounted, in parking lots or service stations, although several were mounted on building walls. All such signs, with the single exception discussed below, were positioned substantially above a driver's line of sight.

21. As discussed above (19), recent research has shown that advertisements that are elevated above the road surface, and above the driver's eye point, are less likely to be viewed when a driver is engaged in typical, and necessary, scanning of the environment. This is because such scanning takes place along a horizontal plane because this is where possible hazards are

likely to appear. According to this research, signs mounted above the road surface are attended to to a greater degree when the driver is not performing a safety scanning task – *i.e.*, when immediate attention is less necessary because the driving task is (temporarily) less demanding. These results suggest that those Fuel signs mounted above the roadway pose a lesser threat of distraction to drivers performing in a demanding environment than any of the City sanctioned signs (other than banners) because all of these City sanctioned signs are located at grade or eye level, within the drivers' direct line of sight when engaged in appropriate scanning behavior.

22. Fuel signs are of uniform size, approximately 67x46 inches vertical, essentially the same dimensions as bus shelter and newsstand end panel signs. And, although City sanctioned signs tend to be of uniform size in a particular application (*e.g.*, all urban panels are of the same size, all double telephone kiosk signs are of the same size, etc.), when the City sanctioned signs are considered as a group, there are many different sizes and shapes. In many cases, the City sanctioned signs are larger, closer to the street, and/or closer to the driver's eye height than the Fuel signs. In some cases, *e.g.* the street facing panels of the newest newsstands, the City signs are significantly larger than the Fuel signs. Larger signs can capture a driver's attention, and can be read, from greater distances. Therefore, other factors held constant (*e.g.* angle to the driver's eye, proximity to curb, etc.) larger signs tend to be more distracting than smaller signs. Finally, none of the Fuel signs depict any movement, none display video, and none present the appearance of flashing. As discussed earlier, the human eye is instinctively drawn to such visual stimuli. Thus, for these distinctions as well, many of the City sanctioned signs pose a greater risk of driver distraction than do the Fuel signs.

23. During my two days of site visits, the Fuel signs that represented, in my opinion, the greatest potential concern for driver distraction were located at the southwest corner of 3rd

Avenue and East 16th Street, where they can be seen by southbound traffic on 3rd Avenue. In contrast, a more typical Fuel sign was located mid-block on the north side of West 87th Street, between Broadway and West End Avenue, within the entrance to a parking garage. Distraction from an advertising sign at a mid-block location will generally cause less concern for traffic safety than distraction at an intersection because the mid-block location almost certainly will have fewer vehicle turning movements, fewer pedestrians crossing, fewer decisions to be made by drivers, and fewer official traffic signs to observe.

B. Bus Shelters

24. I observed both new and old shelters, and it is my understanding that eventually many old shelters will be replaced by the newest Cemusa structures. These shelters are typically three sided, with the long open side facing, and parallel to the curb, and an advertising panel on the left side when viewed from the street. These panels are internally illuminated. Although most of these advertising panels display a fixed message (one inside and one outside), I observed several shelters with scrolling advertisements, I-Share signs, and LCD displays. A fuller discussion of these is contained in the section below.

25. Bus shelters, too, must comply with the City's siting criteria, and my sample measurements indicate that they do so. The size of the advertising panels appears to be uniform, and the samples that I measured are approximately 67x46 inches vertical.

26. On one-way streets or avenues, only the inside advertising panel is likely to be visible to vehicular traffic moving along the same street as the shelter. On two-way thoroughfares, drivers would see the inside panel for shelters on their right, and the outside panel for shelters on their left (across the opposing traffic lanes). In addition, for drivers on a cross

street approaching an intersection with a shelter located on the opposing street, the outside panel will be visible.

27. Because of their size, internal illumination, and visual prominence near intersections, bus shelter signs are potential distractors. Of course, the presence of a bus may block the view of a shelter and its signage, but that is true for any structures and any signs. In addition, a shelter crowded with people may obscure a driver's view of an interior shelter sign.

28. Several bus shelters that I observed contained scroller advertising. In all cases that I observed, the outside panel contained three separate advertisements and the inside panel contained two. In all of these cases, each ad remained visible in a fixed position for six seconds, followed by a three-second transition to the subsequent ad. The panels rotated from one ad to the next in both an upward and a downward scrolling pattern. These signs were of essentially the same size as the fixed ad panels on bus shelters, and were internally illuminated.

29. As stated previously, the human eye is drawn to motion. The movement of scrolling advertising panels at some bus shelters is, therefore, a potentially greater source of distraction than would be a fixed sign at the same location, assuming, of course, that they are of equal size and brightness. In addition, based on the well documented Zeigarnik Effect (18) discussed earlier, I believe that it is possible to capture a person's attention for an extended period of time by providing only a partial message during each display phase of a sign that can support frequent message changes. In other words, if an advertiser chooses to develop a complex message that can be divided into two or three different segments, and then display that message on a scrolling sign where only one part of the complete message is displayed at a time, the Zeigarnik Effect suggests that viewers will be likely to watch the sign for a longer period of time, in an effort to observe the complete message. Similarly, the slow (three second) transition

between successive messages on scroller signs, where part of one message disappears from view at the same time that part of the next message appears, raises the additional concern that a driver could be distracted for an extended period of time in anticipation of the next sign to appear. As discussed above, recent research has demonstrated that driver inattention for periods of 0.75 to 1.6 seconds or longer is associated with a higher accident risk (15,16,17). A three second message transition time coupled with advertisements of interest, could, in my opinion, attract driver glances long enough to be of concern.

30. Thus, the potential for driver distraction by scrolling signs at bus shelters, because of the movement itself, the potential for sequenced messages, and the extended transition time between successive messages, is high, and this potential is, in my opinion, considerably higher than the potential distraction from Fuel signs.

31. An example of a scroller sign on the exterior of a bus shelter that is visible to traffic on the opposite side of a two-way street can be found at the southeast corner of West 14th Street and 9th Avenue.

32. I observed several bus shelters in which a two-line digital display above the inside panel presented financial/stock market information ("I-Share signs"). These displays consisted of characters created by a series of LEDs in a 7x5 inch vertical matrix. The displayed message was in nearly constant motion, with the message moving from right to left across the screen. Because of their near constant motion, and because the information presented is always changing, these displays have a high potential to distract a driver who can see them. The mitigating factor is that the signs are rather small (approximately 46x9.25 inches horizontal), located inside the shelter, and mounted near the top of the structure, making them less conspicuous and less legible to approaching drivers. The dichotomous nature of I-Share signs –

highly attention-getting and distracting when they can be viewed by drivers, and not at all distracting when they cannot, provides an excellent example of how the City's siting criteria for such advertisements is insufficient to address the potential for driver distraction. A true set of guidelines or regulations intended to minimize such distractions would contain specific design and placement requirements for signs such as I-Share to ensure that they were not in a position to distract drivers while still permitting them to provide information to pedestrians and those waiting for their bus.

33. An I-Share sign visible to drivers can be found on Broadway at West 75th Street, where the sign is visible to drivers northbound on Broadway.

34. I observed a number of bus shelters where the outside panel incorporates full motion video on LCD screens. For reasons discussed above, signs that display full-motion video have great potential to capture driver attention and cause distraction because the human eye is drawn to motion, and because the advertising message(s) displayed can compel the viewer to watch the screen for extended periods of time. It is my opinion that full motion video screens on bus shelters have significantly more potential to distract drivers than do Fuel signs.

C. Newsstands

35. I observed several new Cemusa newsstands, some of which were still under construction or had not yet been outfitted with their advertising signs. These newsstands can be thought of as three-sided structures, with the "open" side serving as the counter where the customer makes purchases. For purposes of my analysis, I refer to this as the "front" of the structure. The right side (when facing the front from the sidewalk) consists of an access door into the newsstand and a rack on which magazines may be displayed. The left side contains an

advertising panel as does the back, the side that faces, and is parallel to, the street. The back side is by far the largest, measuring approximately 120 x68 inches horizontal; whereas the side panel measures approximately 67x46 inches vertical – essentially the same size as Fuel and bus shelter signs. The advertising signs on the back of newsstands are the largest signs that I observed during my field study, more than 2.5 times larger in area than bus shelter, newsstand side panels, or Fuel signs (56.7 vs. 21.4 square feet). Each of these advertising panels is internally illuminated.

36. Depending upon the specific siting of an individual newsstand, approaching drivers may see more or less of the advertising faces. On both one-way and two-way streets and avenues, with the newsstand on the driver's right, he will see the smaller of the two advertising panels directly in his line of sight. Conversely, when the newsstand is on the driver's left, he will see the magazine rack/entry door instead of the advertising panel. With regard to the large advertising panel on the back (street) side of the newsstand, a driver approaching the newsstand on the right may see the panel in his or her peripheral vision, and at a rather acute angle. Indeed, it may require the driver to turn his head to facilitate reading the ad. When the newsstand is on the driver's left, however (whether on a one-way or two-way street), the line of sight to the large panel is closer to the driver's expected cone of vision, and the ad can be seen earlier, and for a longer period of time, than the equivalent sign on the right. Finally, when newsstands are located at intersections where they can be seen by traffic approaching on the cross-street, the large panel can appear directly within the driver's line of sight upon his approach to the intersection. The size of the advertising panel that faces the street is relevant to the analysis of its potential to distract, particularly at those intersections at which this large panel directly faces approaching drivers, or where it is visible across the street on a driver's left. Here again, as

further discussed in the next section, a regulation of advertising signage on newsstands that was truly based on traffic safety concerns would distinguish those structures that could and could not contain such advertising based on their location and the ability of a driver to see such ads. In my opinion, the large, internally illuminated advertising panel on the back of new newsstands has the potential to cause a significantly greater degree of driver distraction than any of the Fuel signs that I observed.

37. An example of a new newsstand in which the large panel faces cross traffic can be found at the northeast corner of 6th Avenue and West 46th Street, where this sign is prominently visible to eastbound traffic on West 46th Street as it approaches the intersection. A newsstand in which both the large panel and the smaller side panel are visible to drivers is located on East 42nd Street near 3rd Avenue, where both panels are visible to eastbound drivers on 42nd Street.

D. Public Telephones (PPTs)

38. Public telephones in New York are ubiquitous. A chart of locations indicates that there are more than 23,000 such installations throughout the city. These phones may exist as single devices, or in banks of multiple phones within the same structure. Although I understand that there may be PPT installations that include more than three phones, during the site visit I observed only single, double, and triple phone installations. In many cases, PPTs are illuminated at night, although I observed several that were not. Given that the user accesses the phone from an opening on the front side (that closest to the building line), there are three other faces that may contain advertising. These are the left and right sides (those perpendicular to the curb) which are of uniform size (approximately 50x26 inches vertical), and the back side (closest to, and parallel to the curb) which is sized differently depending on the number of telephones in the particular

installation. I understand that PPTs in historic districts do not have advertisements on the back side, and I observed several such PPTs during the site visit.

39. As is the case with other City sanctioned structures carrying advertising, it is my understanding that PPTs must comply with the City's siting criteria. My measurements of a small sample of PPTs indicate that they are in compliance.

40. From the perspective of possible driver distraction, and as stated above, when other factors are held constant, the larger the sign, the more likely it is to capture attention, and the more complex can be the text or graphics presented on it. Accordingly, I find that single PPTs would be the least distracting, and triple PPTs, the most. Of the PPTs that I observed, the majority were doubles (67, vs. 42 singles and 12 triples), and these have the potential to distract, particularly when illuminated at night and when located such that drivers approaching an intersection on a cross street are looking directly at the largest sign face (on the back of the PPT).

E. Urban Panels

41. Urban panel is the name given to advertising signs that are mounted to subway station entrances. There are typically two faces; the "inside" face describes the panel that faces the staircase down to the station, and the "outside" face describes the panel that faces the street on the opposite side of the entrance. Depending upon location and relationship to an intersection, either the inside or outside face may be visible to vehicular traffic. Sign sizes are somewhat smaller than those of bus shelters, newsstands and Fuel signs, measuring approximately 50x28 inches horizontal.

42. I observed a number of urban panels that display full motion video on LCD screens. These screens are in the same location as the outside panel in fixed installations. As

discussed above, signs that present full-motion video can capture and hold driver attention for extended periods of time. Urban panels, because of the historical location of subway station entrances, are typically placed close to intersections, and these signs are often visible to drivers from several different directions. As stated above with regard to LCD video screens at bus shelters, it is my opinion that full motion video screens on urban panels have significantly more potential to distract drivers than do Fuel signs.

43. One example of a video screen on an urban panel where traffic demands are particularly high is the location within a pedestrian refuge island immediately north of Columbus Circle.

F. Banners

44. Of the City sanctioned signs, banners caused me the least concern for contributing to driver distraction. First and foremost, this is because they were located high above the road surface, above a driver's likely horizontal scanning pattern under the driving conditions present. Second, banners were typically located in mid-block, thus reducing the concern for possible distraction at intersections. Third, since they were anchored to their mounting poles at both top and bottom, they did not flutter or move in the wind. Fourth, although there were several blocks with many banners of multiple different messages, the messages were often simple and straightforward, permitting drivers to view them only briefly before returning their gaze to other targets. Fifth, when several banners within the field of view all displayed the same message, there would likely be little need for a driver to fixate more than very briefly on other than the first banner encountered, since the message is the same for all. Finally, banners played little or no role at night since they were not illuminated.

45. Although I observed banners along nearly every major street and avenue, the length of 57th Street stands out for the prominence of its banners.

Sign Size, Elevation Above Grade, and Distance From Curb Line

46. Within the discussion above, mention was made of sign dimensions, recognizing that, the larger the sign, (other factors held constant) the greater the distance from which it will be visible, and the more likely it is to be conspicuous to, and therefore attract the attention of, approaching drivers. Two other measurements also warrant brief mention here. The first is the elevation of the sign above the sidewalk grade; the second is the distance that the sign is set back from the curb line.

A. Sign Dimensions

47. During the site visit, I made measurements of representative signs. These measurements may differ somewhat from any “official” measurements supplied by the sign owners to the City, since I was measuring either frame edge to frame edge, or the “sight” dimensions (i.e. that part of the display that could be seen by an observer). Nonetheless, my measurements showed that City sanctioned signs at bus shelters, whether old or new, as well as the side panels of newsstands, are of the same overall dimensions as Fuel signs, approximately 68 inches high by 48 inches wide. However, as discussed below, these City sanctioned signs are, almost without exception, closer to the curb and to the driver’s line of sight (horizontally and vertically), and thus are potentially more attention-demanding and distracting to drivers than the Fuel signs.

B. Sign Elevation Above Grade

48. For City sanctioned signs, all bus shelters and newsstand signs are placed at, or a few inches above grade. The majority of the others (urban panels and PPTs) are placed roughly at eye level (44 to 58 inches above grade). Only banners are placed well above a driver's line of sight. In the case of Fuel signs, I observed only one intersection at which these signs were at grade level. All other grade level Fuel signs that I observed were within parking garage entrances. The majority of Fuel signs that I observed were located on building walls or free-standing posts at parking facilities and service stations, where their height above grade is well above the driver's line of sight. In my measurements, these post or wall-mounted Fuel signs ranged from 95 to 107 inches above grade.

C. Sign Distance From Curb Line

49. When measured from the curb to the nearest edge of the sign face, City sanctioned signs at bus shelters, newsstands, and PPTs range from approximately 36 to 41 inches from the curb. Conversely, the Fuel signs that I observed range from 98 to 219 inches back from the curb edge. This difference in distance of the sign from the driver's eye (by a factor of 3 to 4) results in three potentially important distinctions. First, for signs of equal size and luminance, the closer sign will appear both larger and brighter (at night). Second, for a driver in a given location, and for signs that are parallel to the driver's path, the sign that is set farther back from the curb is likely to be outside the driver's cone of vision, i.e. in the periphery of the driver's visual field. Thus, the sign set further back from the curb may require a head rotation from the driver to view the sign, an action that is less likely to be made the more demanding the driving conditions are. Signs set closer to the curb are more likely to be within the driver's cone of

vision, and therefore not require such a head movement. Third, the farther back a sign is from the curb line, the more likely it is to be obscured from a driver's view by pedestrians, sidewalk vendors, and street furniture.

The City's Responsibility to Protect Public Safety through Objective and Neutral Standards for Outdoor Advertising and Appropriate Use of Traffic Control Devices

50. As stated early, I recognize that the City has both the authority and the responsibility to protect public safety for drivers, pedestrians, bicyclists, and others who use its streets. The City has taken many steps to enhance traffic flow and safety through its development, implementation, and enforcement of certain unique traffic regulations. In addition, proper and consistent use of official TCDs is the most appropriate means to accomplish this purpose. National standards exist for nearly every aspect of the design, placement, and use of such devices, and the City should ensure that it is using TCDs appropriately and consistently.

51. In contrast to official TCDs, advertising signs exist to draw the attention of the viewer in order to communicate a message that is, almost always, irrelevant to the driving task. When such advertising signs are located in areas where the driver's task demands are high, and when they are designed and operated in a manner that may capture the driver's attention, in some cases for extended periods of time, the resultant distraction from the driving task is a cause for concern because of the potential for higher crash likelihood. The City's siting criteria, ostensibly intended to, in part, enhance traffic safety, do not address these important aspects of advertising sign control. This section addresses the key issues involved.

Advertising Sign Placement and the City's Siting Criteria

52. The City has developed, and has in place, a set of "siting criteria" which provide standards for the location of street structures including newsstands and PPTs. In general, these criteria specify the distance from the curb or building line that such structures can occupy. Ostensibly based on a standard for safety, the siting criteria do provide for clear and appropriate sightlines from turning drivers to pedestrians who may be crossing the street in the driver's path. To this extent, the siting criteria serve a valuable purpose. Unfortunately, the siting criteria do nothing to address the critical issues of driver distraction and inattention from advertising signs, nor do they attempt to do so. As far as I know, the City has developed no such criteria, and traffic safety is therefore unaddressed in the City's process for approval of advertising signs on structures located on city property.

53. From the perspective of traffic safety, in a highly urbanized environment the most important concern with regard to the placement of advertising signs is that they not be located within the driver's cone of vision at intersections where critical decisions must be made, and where the greatest chance for inattention related crashes exists. In addition, such signs that fall within the driver's (horizontal) scanning pattern at such locations should be avoided. Yet the city's siting criteria are silent on these concerns and, as a result, numerous City sanctioned advertising signs fail this important test. Worse, larger and brighter signs, and those that display motion, exacerbate this risk, yet many City sanctioned signs prominently visible at intersections present these features.

54. In contrast, I observed only one location (3rd Avenue at East 16th Street) where Fuel signs were clearly visible to approaching drivers at an intersection. The majority of the Fuel signs which I observed were either located mid-block, within garage entrances, or elevated

above the driver's typical line of sight.

Lighting Levels of Signs and TCDs

55. If the city is to undertake an objective, neutral, assessment of outdoor advertising signs vis a vis traffic safety it must be able to set and ensure compliance with standards for luminance, or brightness, of such signs as well as official traffic signals. A review of the lighting information provided to the City by Cemusa indicates that details are given for the number and type of lighting fixtures used in its signs, but there is no objective way to translate these specifications into luminance measurements – measurements which provide an objective basis for comparison. As stated above, it would be appropriate for the City to establish standards, based upon its own research or that performed elsewhere, for maximum luminance levels for illuminated advertising signs within the driver's field of view, as well as for minimum luminance levels for its traffic signals. Since the eye is attracted to bright lights, and since, at night, a bright light can not only capture attention but can impair a driver's dark adaptation to the road, traffic, and TCDs ahead, objective standards for the maximum acceptable luminance of lights that are irrelevant to the driving task would be a valuable safety advance.

56. At night during the first day in the field, I measured sign brightness for 13 different signs (2 scrollers, 1 urban panel, 2 LCD videos, 2 Fuel, 4 PPTs, and 2 newsstands). Since I counted the 3 exterior and two interior scroller panels separately, I actually measured 16 sign faces. The results show that, almost without exception, the City sanctioned signs exceed the brightness of the Fuel signs. Further, there is far greater variability in the brightness range exhibited by the City sanctioned signs indicating a lack of control over such sign characteristics. These results are shown in the chart that is attached hereto as Exhibit C. I found two City

sanctioned signs that I thought were too bright. These were a scroller on the outside of a new bus shelter at the southeast corner of Park Avenue South and East 23rd Street, and an LCD video sign on an urban panel at the northeast corner of the same intersection. This, however, was a subjective judgment, and should not serve as a basis for standards setting.

Signs Featuring Motion or Apparent Motion

57. Despite inconsistent regulations for the control of outdoor advertising across States and local jurisdictions, there is one restriction that is widespread throughout the country – that is that signs that display actual or apparent motion are prohibited on billboards or off-premise signs that are visible to drivers. I observed four types of City sanctioned signs that display motion – LCD displays on bus shelters and urban panels, scrolling signs on new bus shelters, and I-Share displays inside certain bus shelters. I believe that signs with actual or apparent motion, especially where the content can be essentially limitless, or where an advertiser’s message can be “sequenced” across multiple display changes, have a significantly higher likelihood of causing distraction than do any Fuel signs. This is of special concern when the task demands placed upon the driver are high, such as at intersections. Although many of the City sanctioned signs displaying motion are not very visible to drivers (for example, those scrolling and I-Share signs on the inside of bus shelters), it does not appear that these restrictions result from any considered approach by the City to prevent drivers from seeing these signs, because scrolling signs and LCD displays on the outside of shelters and urban panels are highly conspicuous to drivers.

58. Of those that I observed, almost all of the City sanctioned advertising signs that use motion are located at or near intersections, and many of them are well within the cone of

vision for drivers at or approaching such intersections. Thus, they present a significantly higher potential for driver distraction than Fuel signs, which do not display motion of any kind.

Official Traffic Signs, Signals and Markings

59. Official signs, which may be categorized as regulatory (*e.g.* Speed Limit, No Left Turn, Buses Only), warning (*e.g.* Lane Ends, Curve, Rough Road), or guidance (*e.g.* Museum Next Left, Cross-town Traffic Use Thru Streets) form one critical part of a nationwide, standardized, motorist information system which is designed to move traffic as smoothly and safely as possible. The other two key components of this system are signals (*e.g.* Traffic Lights), and markings (*e.g.* crosswalks, lane dividers, painted signs in the roadway informing of School Zones). New York City adheres, for the most part, to this nationwide standard, with certain acceptable exceptions that respond to strictly local conditions (such as Thru Streets described above). There are literally hundreds of signs, signals and markings approved for use as conditions warrant, and New York City employs many of them. (It should be noted that, to some extent, many of these TCDs are required by law but are irrelevant to most drivers [*e.g.* Truck Weight Limits for bridges]).

60. Unfortunately, the City ignores some of the key tenets of these requirements and guidelines. Although sign placement, (as well as sign shape, size, color, and content) is governed by the Federal Highway Administration's Manual on Uniform Traffic Control Devices (1) the City seems to have placed many signs at locations of opportunity rather than prescribed locations for easy and clear reading by drivers. I observed several locations where official signs were placed too high for easy viewing, where they were obscured by structures, other signs, or even sanctioned advertisements, or where there were so many official signs at a single location that it

would be all but impossible for a driver to take them in. An excessive number of signs at an intersection can, by requiring so much time to observe and read them, create a state of driver inattention to, or distraction from, the driving task. When the City permits or creates such TCD proliferation, they harm their own cause of protecting traffic flow and safety. The City compounds this error by sanctioning advertising devices at such intersections, seemingly without regard to the already burdensome task imposed upon the driver. Research has shown that the presence of advertising signs at intersections compromises the driver's ability to detect and respond to official traffic control devices at these locations (21,22).

61. In contrast, I observed only five locations where Fuel signs were located near intersections. And in four of these, the signs were elevated above the line of sight of a driver engaging in proper scanning behavior. Thus, I believe that there was only one intersection at which Fuel signs were directly within the driver's line of sight, and this was not an intersection with an overload of official TCDs.

62. I believe that any objective and neutral effort by the City to develop true safety criteria for the placement of advertising signs on city property should also account for the City's official traffic control devices that may be located within the driver's field of view at any sites that are selected.

Summary and Conclusions

63. During the course of two days and one evening, I visited 24 different Manhattan locations to observe examples of Fuel signs and City sanctioned signs on bus shelters, newsstands, telephone kiosks, banners, and urban panels. I selected sites to visit that represented different localized environments in which drivers had to perform their principal tasks. As might

be expected, I determined that certain characteristics of signs, primarily related to motion, size, luminance, conspicuity, and placement within the driver's line of sight, contributed to the potential for driver distraction. In addition, certain characteristics of the streets and intersections studied demonstrated that the task demands imposed on drivers is variable. The characteristics that raised workload included: permitted turning movements, crossing several lanes of traffic to reach one's destination, grade separations, and locations with many and confusing official signs, signals and markings. A given advertising sign may cause little or no trouble in locations with low driver demands, yet may be quite inappropriate at other, more challenging locations.

64. City sanctioned advertising signs, whether on bus shelters, newsstands, PPTs, urban panels, or overhead banners, appear to be permitted without regard for traffic safety. As a result, there exists, even in the small sample of total signs that I was able to observe in two days, a wide disparity between those sanctioned advertising signs that may have little impact and those which can clearly command attention at locations where drivers can ill afford to be distracted from the driving task.

65. On the other hand, the Fuel signs that I observed were, without exception, setback considerably further from the curb line than the City sanctioned signs, and thus less likely to enter or remain in a driver's cone of vision. At those locations where Fuel signs were most visually prominent, they were, for the most part, mounted on posts that raised them above the driver's normal horizontal scanning plane, thus rendering them considerably less likely to cause unwarranted distraction.

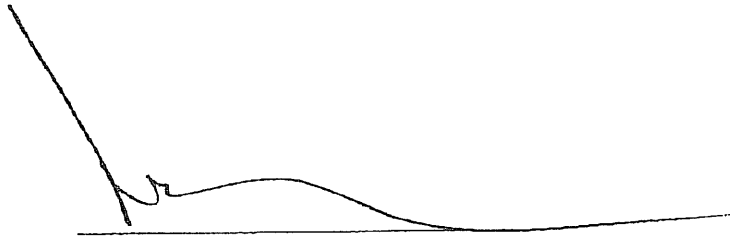
66. I conclude that, whereas there is a wide variation in the type and location of advertising signs that I observed during the site visit, Fuel signs, almost without exception, cause me less concern about the potential for driver distraction than City sanctioned signs, and this

appears to result, in part, from the lack of appropriate safety criteria or review guidance established or used by the City for advertising signs vis a vis traffic safety issues caused by driver inattention or distraction.

67. Before the City acts to restrict or prohibit the advertising signs placed by one company, it should employ objective and neutral criteria that address the placement and display characteristics of all advertising signs visible to drivers within its jurisdiction. Driver distraction is a subject of much current interest in the highway safety field.

68. I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Dated: July 27, 2008
Oakland, California



JERRY WACHTEL